TOP FY 2000
Project Narrative

Rio Arriba Family Care Network, Inc.

Grant # 35-60-00028
Española, NM

Rio Arriba Family Care Network, Española, NM
Rural TeleHealth Network Project

Project Narrative

1. Project Purpose The Rio Arriba Family Care Network (RAFCN)—in partnership with two community-based, multi-site health care systems, a national laboratory, and a major regional hospital—is requesting a grant from the Technology Opportunities Program to support the implementation of the TeleHealth rural electronic patient information network. The TeleHealth Network will be part of the ArribaCare Project, an innovative and collaborative initiative to make affordable health care available to virtually all residents of Rio Arriba County, a largely rural county that has some of the highest rates of poverty, lack of health insurance, alcohol and drug abuse, and other health problems in the United States. The ArribaCare Project, with support from the Robert Wood Johnson Foundation and the W.K. Kellogg Foundation, is working to achieve improved health outcomes through system-wide care coordination and integration of primary care and behavioral health care, and through the creation of a local, public-private health care financing system.

The proposed TeleHealth Network will be a critical link in ensuring the success of the ArribaCare Project. The Network will enable health care providers in this rural area to exchange electronic medical records (EMRs) through a Virtual Patient Record system developed by scientists at the Los Alamos National Laboratory, which is committed (along with VirTx Collaborative Medical Networks) to working with the Project Team to implement the Network. The use of electronic medical records within health care systems has been cited in recent years as a necessary step in improving the quality of health care and in reducing medical errors, which are estimated to cause between 44,000 and 98,000 deaths each year in the United States (Report from the Institute of Medicine, Committee on Quality of Health Care, 2000).

The *end users* of the planned TeleHealth Network will be the physicians and other health care providers at the six in-county clinics of Health Centers of Northern New Mexico; the three clinic sites of Las Clinicas del Norte; and St. Vincent's Hospital in Santa Fe. All of these institutions are represented on the *project planning team* (the same group that will serve as the *project implementation team*), in partnership with staff and Steering Committee members from the ArribaCare Project of the Rio Arriba Family Care Network, a community-based coalition of health and human service providers in Rio Arriba County. Also involved in project planning and implementation are the Advanced Computing Lab at Los Alamos National Laboratory, VirTx Collaborative Medical Networks, and the Shared Solutions Project of the Health Sciences Center and Medical School at the University of New Mexico.

The *beneficiaries* of the project will be the residents of one of the poorest counties in New Mexico, who will experience improved health outcomes, through improved access to a coordinated, multi-site, decentralized regional health care system. These are people who, for the most part, do not have a medical "home," but rather receive health care from multiple providers who serve medically indigent patients—including hospital emergency rooms, often resulting in the clogging of E.R.'s with patients coming for non-emergency conditions.

Ironically, this TeleHealth project—developed and implemented in an isolated, mountainous region populated by rural, traditional Hispanic villages and American Indian Pueblos, with a telecommunications infrastructure that is at best primitive—is pointing toward the future of health care in the United States. The nexus of the health care delivery system is no longer a discrete facility; rather, the critical point of access to health care is rapidly migrating out to decentralized, community-based sites of service. According to the VirTx Group, one of this project's cooperating entities, "While this often represents a more cost-effective and even clinically appropriate delivery system, *the health care industry has not yet evolved an infrastructure truly capable of supporting continuity of care through graduated levels and disparate sites.*" This is the heart of the challenge being addressed by the ArribaCare TeleHealth project. Meeting this challenge will improve health and save lives, with more cost-effective use of limited health care resources.

Problem statement. Rio Arriba County is a largely rural, mountainous county (6.3 people per square mile) in northern New Mexico, with a land area slightly larger than the state of Connecticut. The county's estimated 2000 population is 38,532, of whom 71.4% are Hispanic, and 15.2% are American Indian. Close to one-fourth of the county's families live below poverty level, and the county has unusually high levels of unemployment (usually 8-12%), births to teens (18.1%), and births to single mothers (53%). The county has a mixed economic base, dominated by services, government (mainly schools), logging, and small-scale agriculture; 46% of the county's work force is employed outside the county, primarily in Santa Fe and Los Alamos. Rio Arriba County has achieved some notoriety nationally for having the highest drug-related death rate in the nation, with heroin and cocaine use reaching epidemic proportions. Death rates from alcohol-related causes (alcoholism, liver disease, and auto accidents) are also among the highest in the nation. Death rates are higher than expected for diabetes, accidents, suicide, and homicide.

Health care needs assessments. Rio Arriba County has been designated as Medically Underserved Area. The proposed ArribaCare TeleHealth Project is a direct outgrowth of two lengthy health care needs assessments—one in 1997, and another that is nearing completion in March 2000. Both identified major principal barriers to access to health care: *Lack of health insurance*, with 43% of respondents to a recent survey saying they had no health insurance; geographic *distance and lack of transportation*, in an area where many people must travel 30-60 miles to the nearest health care provider; *lack of behavioral health services*, including mental health and substance abuse treatment; *inappropriate utilization of existing health care resources*, resulting in gaps and unnecessary duplication of services; and *inadequate telecommunications infrastructure* to support health care coordination.

Implications for health care. All of these factors, combined with a technology-poor information infrastructure (described below under *Disparities*) result in poorer health care in a region of great need. The problem is exacerbated by the fact that many Rio Arriba County residents do not have a medical "home" where they regularly receive health care. (In our very recent survey of 781 people, ***49.9%*** said they did not have a regular primary care physician—compared with similar studies elsewhere, this is an astoundingly high percentage.) Instead, they end up receiving care at multiple sites—primarily publicly funded rural clinics, or at the emergency rooms at St. Vincent's Hospital in Santa Fe or the smaller Española Hospital. Health Centers of Northern New Mexico, which operates 14 clinics in the region, has counted 1,125 of their patients that receive care from multiple providers. This problem is typical of low-income populations, who are less likely to have

a regular source of ambulatory care than non-poor, with less consistency in accessing routine and sick care (Health Resources & Services Administration, Maternal & Child Health Bureau, 1997). Areas with large medically indigent populations are also likely to experience over-utilization of hospital emergency rooms. The rate for acute, ambulatory care sensitive conditions (i.e., conditions that could have been prevented or treated in non-hospital settings) in Rio Arriba County is *twice* as high as the comparable state and national rates (NM Health Policy Commission, January 2000).

Proposed solution: The proposed solution to these problems is (a) to support participating health care providers in their conversion to the use of electronic medical records, (b) to facilitate the exchange of patient information using a virtual patient record that enables authorized providers to access patient data instantaneously across dissimilar platforms, and (c) to provide connectivity among the project partners through a high-speed, web-based network (developed with the assistance of VirTx Collaborative Health Networks). The electronic network will serve as the technological infrastructure for the ArribaCare care coordination system.

Patient records and the quality of care. Studies show that *continuity of care* is an important determinant of the quality of care, with provider relationships and coverage eligibility remaining inconsistent for many families in underserved, impoverished, or special needs areas. Where such continuity is absent, the use of accurate, up-to-date, and easily accessible patient records becomes critical: "For improvement in quality of care, availability of health history during encounters has been shown to increase problem recognition, adherence of providers to clinical guidelines, efficiency of lab and procedure ordering, and production of prompts for compliance with preventive care guidelines. In the absence of continuity of provider, a computer-based patient record or summary can offer a family and provider data about prior visits within that site or, as networks become widespread, at other sites of primary or specialty care...Thus *where continuity of provider is absent, a computerized ambulatory record will serve to improve continuity of record, leading to enhanced problem recognition and care coordination.*"

In light of recent reports on the high numbers of deaths attributable to medical errors, the National Academy of Sciences is now saying that "*Computer-based patient record (CPR) technology is essential for health care*...to support clinical decisions and as a key information source for quality review and improvement...Health care professionals and organizations should adopt the computer-based patient record as the standard for medical and all other records related to health care." ("Focusing on Quality in a Changing Health Care System," February 2000, www.nas.edu/21st/health.html). A special interagency report to the President also urges the immediate adoption of electronic medical records and interactive decision-making tools to improve clinical care, accuracy of diagnoses, dosing of medications, and other facets of care (Report to the President of the Quality Interagency Coordination Task Force, February 2000).

Project outcomes. Long-term and short-term outcomes of the project will include:

- Improved health status of patients served by providers using the TeleHealth Network.
- Improved utilization of health care resources: lower use of hospital emergency rooms for ambulatory-sensitive conditions.
- Reduced duplication of services to the same patients among multiple providers
- Improved utilization of prescription medications: reduction in repeat prescriptions or over prescriptions; reduction in preventable negative drug interactions.

- Improved and more timely clinical decisions through immediate access to patient health history information.
- Greater patient compliance with prevention and treatment protocols.
- Reduced costs through more efficient matching of patients to payer sources.
- Reduced costs through more efficient lab and procedure ordering

2. Innovation. The TeleHealth Project will demonstrate a number of innovative features:

- The project will demonstrate a network that enables disparate health care providers and systems with differing electronic medical records systems to share virtual patient records easily and seamlessly, regardless of the respective platforms used.
- The network will demonstrate the use of existing technologies—the World Wide Web, various electronic medical records systems, and the virtual patient record system developed by Los Alamos National Laboratory—to address challenges faced by decentralized health care systems throughout the country, whether urban or rural, regardless of size or complexity.
- The network will be part of a larger, innovative approach to coordinating and managing existing resources to make high-quality, affordable health care widely available.
- The project will demonstrate the effectiveness of a community partnership with minimal management structure, and an information technology system that will interface easily with a delivery system that uses lower skill level people.
- The project will contribute to developing an information technology base for changing U.S. health care systems.

Health care systems are being reconfigured, allowing patient's medical information to be accessed regardless of the site of service. Access to medical information and knowledge is increasingly organized in a distributed, rather than hierarchical fashion. The health care industry needs to evolve an infrastructure capable of supporting continuity of care through graduated levels and disparate sites. Health care is becoming more integrated functionally, while it is becoming more decentralized with respect to delivery sites. Information systems are needed to support this process. This project presents an opportunity to pilot-test a unique system in a rural, high-need area.

The virtual patient record is also undergoing testing at a closed health care system, the National Jewish Medical and Research Center in Denver. A similar project will be implemented in a very different environment, through the Santa Barbara County (Calif.) Care Data Exchange, although it is not clear yet which technologies will be used, and how they will be applicable to other situations. Another closed-system, web-based information technology project is PCASSO, "Patient Centered Access to Secure Systems On-line," being tried within the University of California School of Medicine and Healthcare Network. The Regenstrief Institute at Indiana University is implementing the Indianapolis Network for Patient Care, a shared clinical data repository for used by the hospital emergency department and two managed care systems. The University of Washington School of Medicine has TeleMed project that includes a World Wide Web interface to electronic medical records, as well as telediagnosis and teleconferencing. The proposed ArribaCare TeleHealth Network is unique among all of these efforts, for the reasons cited above.

3. Diffusion potential. The ArribaCare is part of a number of national and regional networks that will serve as avenues for dissemination of information about the TeleHealth Project.

ArribaCare staff regularly participates in national conferences of Robert Wood Johnson grantees working to increase access to affordable health care, and of W.K. Kellogg Foundation grantees that are part of the national Community Voices initiative. These meetings are unique forums for sharing of information and insights with other groups from around the country that are involved in cutting-edge health care projects. The ArribaCare project is part of Shared Solutions, a statewide health care access initiative coordinated by the University of New Mexico Health Sciences Center. As one of their project sites, ArribaCare staff conducts presentations at the annual Shared Solutions conference, to practitioners from throughout New Mexico and from other states as well. ArribaCare is also part of other regional and statewide networks, including the New Mexico Primary Care Association and Re-Visioning New Mexico.

The ArribaCare project has been featured in new stories at the local, state, and national levels; this kind of exposure will be more frequent as the project is fully implemented. Incorporation of the TeleHealth Project will be of enormous interest to the audiences and networks that are already aware of ArribaCare. The TeleHealth Project will also be featured on the RAFCN web site, as well as those of the Robert Wood Johnson, Kellogg, and other national funders and networks.

4. Project Feasibility. The proposed TeleHealth Project will build on existing resources and technologies, much of which has been brought into place as part of the TeleMed project during the past three years, supported by a grant from the Telecommunications and Information Infrastructure Assistance Program. That project accomplished three objectives: (a) the development of the virtual patient record software, (b) the putting in place of hardware and software to provide connectivity among the project partners, and (c) partial deployment of a system to share childhood immunization data, as part of what will be a statewide immunization information network. Perhaps most importantly, that project resulted in the creation of a sustainable network of partners who have continued to work together after the end of the grant period, and who have now teamed up with the Rio Arriba Family Care Network to plan and implement the ArribaCare/TeleHealth Project.

The TeleHealth Project involves the following partners, all of whom are involved in both the planning and implementation of the project:

- Rio Arriba Family Care Network/ArribaCare Project, overall responsibility for project coordination and implementation, and integration with the ArribaCare Care Coordination model;
- Health Centers of Northern New Mexico, a Federally-Qualified Health Center operating clinics at 14 sites throughout northern New Mexico, 6 of which are in Rio Arriba County;
- Las Clinicas del Norte, another Federally-Qualified Health Center, with three clinic sites, all within Rio Arriba County;
- St. Vincent's Hospital, a private, non-profit hospital serving the entire northern third of New Mexico.

Acting in technical support roles (again, in both the planning and implementation of the project) are the Advanced Computing Lab at Los Alamos Laboratory (developers of the virtual patient record system) and VirTx Group, a private company specializing in the design and deployment of Collaborative Medical Networks. As a collaborator in the ArribaCare Project, the University of

New Mexico Health Sciences Center will also be involved in developing, implementing, and evaluating the TeleHealth Project.

Technical Approach. The TeleHealth Project involves installing site-specific electronic medical records systems at each of the participating health providers, all of whom will then be connected through the virtual patient record system. A major advantage of this approach is that it allows each provider to use an electronic medical records system that meets their unique needs and constraints. Each of the providers is in the process of evaluating potential systems for selection and inclusion in this project. All three systems will meet applicable standards in the field: CORBA-med (Health Level 7 Compliant), COAS (Clinical Observation Architecture Service), RADS (Resource Access Decision Service) authentication system, and PIDS (Patient Identifier Service) protocol. A 1999 survey conducted by Healthcare Informatics listed 124 self-described vendors of computer-based patient record systems; according to the Medical Records Institute, very few of these vendors' systems meet the Institute's stringent and comprehensive criteria for electronic medical records systems. The participating provider organizations will conduct a rigorous evaluation of the available EMR systems and will verify that they meet necessary standards, as well as, are easily accessible to providers.

The virtual patient record system combines mainstream information systems, telemedicine, relational databases, Java, CORBA, object-oriented technology, three-tier client/server architecture, the Internet, Web browsers, encryption, portable hardware tokens, a master patient index, artificial intelligence, and other technologies. Rather than rely on one software program to serve as the electronic records system, the virtual patient record uses different technologies to access, gather, and present information from varying systems at various locations. It then displays the health data in a cohesive, seemingly integrated fashion on a physician's desktop computer. It is a system that is designed around the needs of the clinician, in order to provide improved health care. The virtual patient record uses technology to gather clinical data from disparate sources—a laboratory information system, physicians offices at clinics, a participating pharmacy, etc.—and then presents the data on-screen for caregivers, "virtually integrating" the data in such a way that it appears to the user that all the data resides in the same system. The system automatically performs many data-gathering and comparison functions and presents a patient's medical information in a graphical, easy-to-follow manner. The system uses a unique encryption tool to protect data confidentiality, with private keys unique to each system user.

The project team has researched alternative technologies, and has chosen this one because of its flexibility in accommodating differing platforms at the provider level, and because it will accommodate future growth and expansion, both in terms of additional participating sites or networks (other providers that have expressed interest in joining the project at a future date), and in terms of additional kinds of information, such as behavioral health, dental health, and case management files, all of which will likely be added in the third year of the project. The project will be maintained by a RAFCN information specialist, working in tandem with information systems specialists at the various participating sites, following the end of the grant period.

Applicant Qualifications. See appendix for a list of team members/consultant and their qualifications.

Budget, Implementation Schedule, and Timeline. The TeleHealth Project can be broken down into four distinct phases, the first of which is currently under way:

- Preparation: Completion of on-site connectivity and hardware requirements among the project partners. All of the project partners have installed Frame Relay for 56K connectivity and all are wired for intranet communication, used primarily for e-mail and patient billing. RAFCN has an NT server, with partial T-1/384K currently being installed. (Installation will be complete by the time this proposal is submitted.) RAFCN is poised to become a web host.
- Project Year I: Implementation of site-specific electronic medical records. Each of the three participating health providers is preparing to convert to electronic medical records. Project activities during this first year will include:
    - System design and installation, with on-site technical assistance provided to the partners through the auspices of the TeleHealth Project
    - Selection of electronic medical record systems
    - Collection of baseline data for evaluation of project outcomes
    - Final design of virtual patient record system and interface with participating providers
    - Development of parallel software and connectivity for ArribaCare care coordination system
- Project Year II: Deployment of virtual patient record system, using protocols developed jointly by Los Alamos Laboratory and VirTx. Project activities will include:
    - Interfacing virtual patient record system with electronic medical record systems at the participating sites
    - Developing security and authentication policies and procedures
    - Pilot-testing the system
    - Data collection
- Project Year III: Full implementation of virtual patient record/electronic medical record system. Project activities will include:
    - Monitoring, troubleshooting, and maintenance of system
    - Integration with ArribaCare care coordination information system
    - Incorporation of behavioral health and dental health information into virtual patient record system.

Budget proposed, cash contributions and in-kind support is a direct result of the above identified phases/timelines.

Sustainability. The ArribaCare Project has a Sustainability Workgroup that is currently refining a plan for long-term sustainability for the project. Please refer to the attached "ArribaCare Funding Matrix". The overall ArribaCare Project and its sustainability plan considers the long term financing for the network system being proposed to TOP.

5. Community Involvement. The ArribaCare/TeleHealth Project literally grew out of comity involvement, and its roots and governance continue to be part of the larger community. The TeleHealth project evolved from the merger of the ArribaCare Project and the TeleMed project, and earlier effort to put health information infrastructure in place. Both are now under the auspices of the Rio Arriba Family Care Network, a community-based coalition representing 30 health and

human service providers. RAFCN includes an independent Office of Consumer Affairs, and RAFCN has been appointed as an advisory council to the Rio Arriba County Commission in matters regarding health and human services. The ArribaCare Steering Committee ensures direct community participation in the project, with representatives of health care providers, education, substance abuse programs, and consumers. The ArribaCare/TeleHealth Project is also closely tied to the Rio Arriba County Maternal and Child Health (MCH) Council. It was the MCH Council, in fact, that sponsored the 1997 Needs Assessment (along with RAFCN) that resulted in the creation of ArribaCare. ArribaCare has several built-in mechanisms to ensure continued community involvement, including needs assessments and consumer representation in governance and decision-making. TeleHealth is a direct outgrowth of this community process.

6. Reducing Disparities. Northern New Mexico lags behind the rest of the country in a number of key telecommunications areas. Telephone service has been notoriously poor. Some attendees at a Rio Chama Telecom Coalition conference this month complained that they have been on a waiting list for telephone service for six years, with some rural residents resorting to using cell phones for Internet access. (A local consortium of Hispanic businessmen has recently purchased the telephone system from GTE, and improvements are hoped for.) The county has five local Internet service providers, with none of the national ISP's providing local access numbers. Dial-up access is limited to 28.8K bps as the best committed information rate in the county. National studies of Internet penetration show that people living in rural areas at the lowest income levels with low levels of education are the among the least connected. Rural households earning between $5,000 and $10,000 have the lowest computer ownership rates (7.9%) and on-line access rates (2.3%). (Figures from U.S. Dept. of Commerce, *Falling Through the Net II: New Data on the Digital Divide*, July 1998.) Rio Arriba County's *average* income is only slightly higher than $10,000, and 39% of the county's Hispanic residents have not completed high school. Hispanics are one-third as likely as Whites to have on-line access (7.7% versus 21.2%, according to *Falling Through the Net*). Although data on computer ownership and on-line access for Rio Arriba County are not available, it can be assumed that these national figures apply to Rio Arriba County as well.

Health care providers have had to function within this technologically challenging environment; they have worked hard just to develop basic Internet access, as well as the capability to convert to electronic medical records, as described above under Project Feasibility. For example, Health Centers of Northern New Mexico has extremely limited Internet access through a single PC, although they will finally be getting full Internet access. Health Centers is part of a National Diabetes Collaborative sponsored by the U.S. Public Health Service, Bureau of Primary Health Care. However, their participation in this important national group has been severely hampered by their limited Internet access. Similarly, the organization's Medical Director and Associate Medical Director were asked to participate in a medical management course sponsored by Johns Hopkins University and the U.S. Public Health Service, working through an on-line web cast that required high-speed Internet access. Instead, they had to rely on printed materials.

The ArribaCare/TeleHealth Project does not directly address disparities with respect to access to technology by individual households. Rather, the project is an innovative initiative to apply existing technology in a creative way to improve quality and access in a health care delivery system that is hampered by its inability to record and share patient data electronically.

7. **Evaluation and Documentation.** The purpose of the evaluation of this project (i.e., the central evaluation question) will be to assess the extent to which the project achieves its stated outputs and outcomes. Those outcomes, as framed earlier in this proposal, are somewhat complex, in that they combine health status outcomes, technological outcomes, fiscal impacts, and programmatic accomplishments. Each of these outcome areas will require different evaluation strategies, data collection methods, and areas of evaluation expertise. All will require collaborative efforts, involving both professional evaluators and staff of the project partners. The evaluation plan will be worked out in detail following notification of funding, in time to begin gathering baseline data during the first year. We will also look at evaluation techniques used by other health/technology projects, including a TIIAP-funded project in Lake County, Illinois. Principal; non-technology evaluators will be consultants Ron Hale and Stephen Poe, and Summers Kalishman of the University of New Mexico Health Sciences Center (See Applicant Qualifications section). A continuing technology assessment will be conducted by the VirTx Group. The following table summarizes the kinds of data needed:

Outcomes	Data Needed
Improve health status	Selected health status indicators, patient interviews & surveys
Improved Utilization	Utilization records, Health Policy Commission data on hospital intakes & discharges
Reduced duplication of services	Patient records, patient surveys
Prescription utilization	Patient records, pharmacy records
Improved clinical decisions	Patient records, physician interviews
Improved patient compliance	Patient records, physician interviews
Improved patient/payer source matching	Patient records, financial analysis
Improved lab & procedure ordering	Patient records, physician interviews
Technology outputs, outcomes	Methods developed by VirTx
Reduced unnecessary emergency room visits	Utilization records, Health Policy Commission data on hospital intakes & discharges